2: Hockings E-4,5 (1962-1977) 1980
AW50 Badaga AW50

small district of Tamil Nadu, altogether covering 2543 sq. km. This is the homeland of the Badaga, Toda, Kota and Kurumba communities; nowadays numerous other peoples also live there.

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For the mildly invigorating qualities of its climate the plateau is therefore scarcely rivalled anywhere in the Asian tropics, and from 1819 British residents began to take advantage of this healthful region. Soon the towns of Coonoor, Kotagiri and Ootacamund (the district headquarters), and the military station at Wellington, took shape and expanded. More recently the town of Gudalur (Gudalu:ru) has grown up in the Wainad, at the foot of the western escarpment. Ootacamund, Coonoor and Gudalur are now the headquarters of the three administrative divisions or *taluks* into which the district was divided by the British.

THE NILGIRI POPULATION

When the British began to settle on the plateau they brought with

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three peppercorns into paste which is bandaged onto the cut. It is said to stop a swelling and infection. For some sixty years past a third species has been used; it is the hemp agrimony, and it supposedly works quicker. Leaves of any of these four species are nowadays ground up with a pinch of salt and applied thus to the wound. A bandage is then tied over it.

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BRUISE (*kandalu*)

6.14. Badagas have no cure for blisters. If these develop on the hand a person continues to work, since his hand must toughen if he is to continue at it anyway. Similarly, no treatment is given for bruises.

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THERMAL BURNS: DRY (*benda huṇṇu*)

6.15. For a burn, the therapist grinds up leaves of *kudure ko:ku* (the name of several pennywort species), then mixes them with slime from some stagnant water, and after applying this to the wound ties a clean cloth over it.

[539]

There is a proverb referring to saliva, oil or any similar first-aid that might cool the sensation of the burning: "He won't [even] put saliva on a burnt hand." It refers to someone too selfish to help another even to this minimal extent.

[783]

One type of burn is not treated at all. If a man returns to the Badaga community from jail, or from having been a Christian convert, he goes through a purification which includes burning the tip of the tongue with a piece of glowing charcoal or gold wire. He must simply allow the wound to heal.

6.16. Another treatment is to take one of the larger leaves of the castor-oil plant, heat it, and put it mixed with gingelly oil onto a wound.

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THERMAL BURNS : WET (*benda huṇṇu*)

6.17. For a scald the therapist grinds some prince's feather leaves and mixes them with twice that amount of some slime from stagnant water. The mixture is then applied to the scald.

Animal Bites

[136]

6.18. As every child knows, many Nilgiri animals bite. The commonest, as well as the smallest of

4: Hockings E-5 (1962-1977) 1980
AW50 Badaga AW50

these, is the flea, "which is very numerous in the early part of the monsoon. They are put to flight by [drinking] an infusion of a plant called by the natives Wassumboo [*vasambu*], (*Acorus calamus*), which is indigenous in the Hills." (Baikie 1857: 110)

6.19. Badagas recognize several types of lice and tick. "All live on the dirt of the body or clothes and are spontaneously generated from it," I was told. It is therefore a shameful matter to have these parasites, when, as one proverb puts it, "Small insects are browsing on the head of an uncaring man." To prevent lice, people wash themselves daily and also shave off pubic hair (cf. 2.13). Epidemics of relapsing fever have spread from time to time through the community with the help of body lice (Madras 1928: 63).

6.20. It is recognized that if the bites of larger animals are not cared for properly they may prove fatal, as one proverb warns: "The person scratched by a porcupine cannot return to the] village; a person scratched by a hyena cannot [return to the] yard." Also in the same vein is this one: "The man who is torn by the ibex is not for the house-yard; the man who is torn by the pig is not for the village"; in short, he is finished. The rarest biting animal, now nearly extinct in the Nilgiris, is the tiger. Only tigers that are wounded in the face or suffer from other ailments that prevent them from hunting effectively will become man-eaters (Anderson 1967: *passim*). There have been few recent cases of tigers mauling Badagas, and there is no specific treatment for such wounds beyond the above-mentioned cures for lacerations. Such treatment is also attempted when Badagas are gored by cattle, primarily buffaloes.

6.21. In a case of dog-bite a small amount of lime is put on the wound, and a small copper coin tied on top of this. The patient should not bathe for three days; on the fourth day the bandage can be removed and the wound is cured.

None but a mad jackal would bite a man. Villagers

4: Hockings E-5 (1962-1977) 1980
AW50 Badaga AW50

would then try to kill it: if they succeed the patient will recover quickly, but if they fail he will become mad too. The actual treatment is the same as for dog-bite.

6.22. It is unlikely that any Badagas have been killed by snake-bite, and the large python (*Python molurus*) is quite rare. A proverb has it that "A cobra won't kill without finding a mistake." This means that if one kicks a cobra (*Naja naja*) unintentionally it will not harm the man because he intended no harm to it. Badagas believe that snakes on the plateau are not as poisonous as those in the plains; they neither kill them nor go near a dead one (Breeks 1873: 104). If bitten by a snake one should immediately tie a tourniquet of some woman's hair, or failing that a thin creeper, around the affected limb or extremity above the swelling. This will help cure it quicker. (The same treatment is used by the Todas; Rivers 1906: 267.)

Sometimes a *mantravadi* (magician) cures snake-bite by touching a special small black stone against the wound, and then tying it there while he says some spells. Although he goes through this magical process only once it will cure the wound. After the stone has been tied to the patient he must not sleep for 24 hours, and must starve totally for the same period. Following a snake-bite water must under no circumstances touch any part of the body, and of course the patient must not walk through a stream or be in the rain.

6.23. If one pulls a bee sting out at once the swelling is small; otherwise its poison goes into the swelling. In a case of multiple stings the person must immediately pour water over the body or jump into a nearby stream. In a bad case the patient will be lethargic and have fever for up to three days; and during that time he must bathe very often in cold water. After each bath any

5: Hockings E-5 (1962-1963) 1989
AW50 Badaga AW50

CHAPTER I

THE GEOGRAPHICAL, HISTORICAL AND ETHNIC SETTING

The Terrain

131 The Nilgiri Hills, once also known as the Blue Mountains, are a plateau some 600 square miles in area, situated in Southern India at the juncture of the three linguistic and cultural areas of Karnatak, Malabar and Tamilnād; or of 631 modern Mysore, Kerala and Madras States. Today the Nilgiris form one small 101 administrative District of Madras State. They are the homeland of the Badaga, Toda, Kota and Kurumba communities; nowadays many other peoples also live there.

133 The plateau is generally in the altitude range of 6000-8000 feet, and one peak (among the highest in peninsular India) reaches 8640 feet. In contrast with this the western quarter of the District averages around 3000 feet in altitude, and 128 forms a part of the Wynaad Plateau. In this study I use the term Nilgiris in its geographical sense rather than its political one, thereby excluding the Wynaad when I speak of the Nilgiris.

133 The slopes of the Nilgiri Plateau fall away very steeply, and on the eastern 137 edge actually drop some 6000 feet in a distance of less than two miles. The slopes •136 have always been covered by a dense subtropical jungle which harbors tigers, leopards, wild buffaloes, elephants, snakes, malarial mosquitoes, and (formerly 115 dangerous) hunting tribes still feared for their sorcery. Until the advent of the

6: Noble K-4,5 (1962-1963) 1989
(1800-1963)

AW50 Badaga AW50
Irula AW53
Kurumba AW56

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English cane. Abandonment of plantation coffee gardens due to coffee leaf disease (Hemileia vastatrix B. & Br.), which reached a climax in the late 1800s, and devastations made by the green bug (Coccus viridis Green), especially between 1900 and 1910, led ultimately to savanna formation. Savannas have frequently been created by Irulas and Kurumbas. Although they have been forced to stop shifting slash-burn cultivation and are now confined to lands they own, cultivated plots are still rotated. Some unused plots are fired or grazed sufficiently for savanna to result. However, both ethnic groups are also responsible for savanna formation in 1) forests affected by annual fires and grazing, on 2) plots abandoned when shifting slash-burn agriculture was still practiced, and on 3) cleared tracts where plantation crops once existed.

[136]
B 137 I Ku 318

1: Thurston & Rangachari E,G-4,5 (no date) 1909
AW50 Badaga AW50

days. Nearly three thousand females, and six thousand males, assembled on Thursday. To crown all the confusion, there appeared nearly a thousand Badagas armed with new mamotis (spades). They came on dancing for some distance, rushed into the crowd, and danced round the car. These Badagas belonged to a gang of public works, local fund, and municipal maistries. On the last day a sheep was slaughtered in honour of the deity. The musicians throughout the festivities were Kotas and Kurumbas. The dancing of the men of three score showed that they danced to music, and the stepping was admirable, while the dancing of young men did not show that they had any idea of dancing, or either taste or knowledge of music. They were merely skipping and jumping. This shows that the old art of the Badaga dance is fast decaying." The cot is eventually burnt at the burning-ground, as if it contained a corpse.

A kind of edible truffle (*Mylitta lapidescens*) is known as little man's bread on the Nilgiris. The Badaga legendary name for it is Pāndva-unna-buthi, or dwarf bundle of food,* *i.e.*, food of the dwarfs, who are supposed once to have inhabited the Nilgiris and built the pāndu kūlis or kistvaens.

The story goes that Lord Elphinstone, a former Governor of Madras, was anxious to build a residence at Kaiti. But the Badagas, who had on the desired site a sacred tree, would not part with the land. The Governor's steward succeeded in making the Badaga headman drunk, and secured, for a rental of thirty-five rupees annually, the site, whereon a villa was built, which now belongs to the Basel Mission.†

* Report, Government Botanic Gardens, Nilgiris, 1903.
† E. Schmidt. Reise nach Sudindien, 1894.

2: Hockings E-4,5 (1962-1977) 1980
AW50 Badaga AW50

small district of Tamil Nadu, altogether covering 2543 sq. km. This is the homeland of the Badaga, Toda, Kota and Kurumba communities; nowadays numerous other peoples also live there.

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For the mildly invigorating qualities of its climate the plateau is therefore scarcely rivalled anywhere in the Asian tropics, and from 1819 British residents began to take advantage of this healthful region. Soon the towns of Coonoor, Kotagiri and Ootacamund (the district headquarters), and the military station at Wellington, took shape and expanded. More recently the town of Gudalur (Gudalu:ru) has grown up in the Wainad, at the foot of the western escarpment. Ootacamund, Coonoor and Gudalur are now the headquarters of the three administrative divisions or *taluks* into which the district was divided by the British.

THE NILGIRI POPULATION

When the British began to settle on the plateau they brought with

2: Hockings E-4,5 (1962-1977) 1980
AN50 Badaga AN50

dissimilar parts by a range of heights running north and south of which Dodabetta ('big mountain') is the tallest . . .

East and south of the Dodabetta range . . . the plateau . . . is extensively cultivated by the immigrant tribe known as the Badagas. This does not improve its appearance; the great forests have mostly been felled and their place taken by the poorest low scrub or by fields of miserable cereals surrounding the squat red-tiled houses of numerous hamlets; the country is deeply scoured by every shower of rain until the infertile red and yellow sub-soil clays are laid bare; and, owing to the Badagas' former custom of shifting their cultivation from year to year to new patches of land, grass has been prevented from getting any firm hold on the denuded hill-sides. Only on the slopes of the plateau (which are too steep for cultivation) and in a few isolated Government reserves, does the forest flourish in its virgin beauty.

West of Dodabetta, however, the Badagas are more rare; hardly a field or a village (except the little clusters of huts belonging to the pastoral Tódas) is to be seen; and the country consists of a sea of rounded green hills, rising now and again into more prominent heights and ranges, which are covered with short grass . . . These rounded hills are divided each from each by streams or bogs, and nestling in their wrinkles are beautiful little woods, . . . the edges of which have been so sharply defined by years of grazing and (perhaps) grass fires that they look almost like artificial plantations. . . .(Francis, 1908, 3–5).

A few of the village names defy any interpretation—either by me or by my best informants—probably because they have changed too much to be recognizable now as Baḍagu substantives. But leaving these aside we still have in the list of toponyms which follows a corpus of 311 meaningful toponyms for a community of about 362 hamlets, 18 of them no longer occupied. Some toponyms are repeated in several places, (e.g., Naḍuhaṭṭi, 'middle hamlet', or Hosaṭṭi, 'new hamlet'); numbers given after some explanations indicate where such a toponym occurs more than once in the Nilgiris. We will now examine the meanings of the toponyms, which are given here in a phonemic transcription of Badagu (a Dravidian language).

3: Hockings E-5 (1962-1963) 1968
AN50 Badaga AN50

But no great change has come in salt-giving and the other important rituals of either the Badagas or the Todas. Indeed, only one general change is apparent in recent performances of the traditional ceremonies: they are done with a minimum of wasted time. Now that Badagas and even some Todas have become involved in the marketing economy, they have less time to spend idly, since time now means income. They tend to perform ritual acts with some haste, and they do not always feel concerned if a minor item in the ritual sequence is altogether omitted from a particular performance. Public opinion still favors as authentic a performance as possible, however, for the relationship between the continued performance of the rituals and the continuance of the social order is even today believed to be a real and crucial one.

Wallace's contention that rituals do not have an information function has, we hope, been qualified by this paper. The kind of information which a ritual such as salt-giving presents is information not available from any other source, whether mass media or traditional oral channels. Neither government nor gossip can reassure a community on the matter of its continued existence as a community; only the periodic re-enactment of roles and the reassertion of traditional values in the indigenous ceremonies of a culture can give Badagas, Todas, and other rural communities the security of knowing that their own particular way of life is both persistent and worthwhile.

NOTES

1. I am indebted to the American Institute of Indian Studies for a fellowship which enabled me to do field research there in 1962-63. The present paper has been written with the help of a grant from the Chancellor's Committee on International and Comparative Studies, University of California at Los Angeles. I am also grateful to M. N. Thesingh, a Badaga Lingayat who provided much of the material, and to John Hitchcock for his helpful criticism.

2. Terracing of slopes and the fragmentation of fields through divided inheritance have resulted, since the 1930s, in fields being too small to plough.

3. Numbering 85,463 persons in the 1961 Census.

4. During the past fifty years some hamlets have included the salt-giving ceremony in their sowing festival. This is convenient because it saves some time and expense on preparations; yet the two ceremonies remain quite distinct from one another.

5. Large groups of Badagas and Kotas used to go together to the market town of Gundlupet in southern Mysore, or to Karamadai, near Coimbatore. They carried hay, honey, opium, and clarified butter with them, and bartered these for salt, crude sugar, rice, coconut, tobacco, and trinkets.

6. Initially trade in the Ootacamund bazaar was handled through barter, but by about 1840 cash had become the general medium.

7. Called *'uppu kuk'ke*, "salt basket," this is made of cane by the Todas, stands about nine inches high (including the loop handle), and is smeared inside and out with cow dung.

8. The term *'hubbe* is used for six species of Leguminosae found at varying altitudes on the Nilgiri Hills. These are (1) the hill forest indigo; (2) the New Spain senna; (3) the tick trefoil; (4) the bell pea or Chinese pagoda tree; (5) *Dumasia villosa;* and (6) mountain downy senna.

9. Otherwise known as bastard mango or honeysweet tree.

41 Hockings E-5 (1962-1977) 1980
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Let us then see how, against this backdrop, several hundred Badaga therapists have over the centuries developed a unique medical adaptation to a unique tropical montane environment.

Badaga Medical History

1.5. The history of health care among the Badagas is entirely speculative. Nonetheless the history of the community itself is clear enough, and on this framework (Hockings 1979a) we can at least postulate three phases in the development of Badaga therapy (1.5-1.8). This sketch may later prove inadequate, for it is largely guesswork, but heuristically necessary for our understanding of problems connected with the elaboration of a specifically Badaga montane curative system from its roots in a very different equatorial environment at a much lower elevation.

The first phase began after the year 1565 with the fall of the Vijayanagar Empire. It was this political act and the associated Muslim invasion that impelled the initial Badaga refugees to leave the plains of Mysore District and settle on the much higher Nilgiri Massif immediately to the south. These people were a mere fortuitous selection of one or two hundred from those who made up the vast genetic pools of the Mysore castes; but after settling on the hills their patterns of intermarriage were such that they became more like another isolate. Despite a preference for endogamy, though, their pool was repeatedly augmented by the arrival of occasional new settlers from the Mysore Plains who were accepted into the growing Badaga community.

A century or so after these first settlers arrived, some refugees forming the Kaṉakka clan also came to the Nilgiris. Their special importance lay in the fact that until the mid-nineteenth century the Kaṉakkas were the only Badagas who were somewhat literate. As

41 Hockings E-5 (1962-1977) 1980
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TRILINGUAL INDEX OF BOTANICAL IDENTIFICATIONS

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Badaga	*Botanical*	*English*	*Pages*
aidumaṇi g:ḍu	*Oenothera odorata*	evening primrose	109
akki ganje	*Hordeum hexastichum*	barley	25
alavan g:ḍu	?		108
aṇila kae	?	"giant squirrel fruit"	122, 123
a:pal haṇṇu	*Pyrus malus*	apple	25
arali	*Nerium oleander*	oleander	177
araÑju	*Citrus aurantium*	orange	25, 33, 201
aravattavare nanus	*Phaseolus vulgaris*	perennial bean	24
aravattu g:ḍu	*Ruta graveolens*	common rue	105, 139, 156
arisina	*Curcuma longa*	turmeric	109, 144, 147
arova sa:me	*Panicum sumatrense*	little millet	25, 83, 90, 103, 109
arukkam (*Tamil*)	*Calotropis gigantea*	swallow wort	70
avuṇḍe	*Ricinus communis*	castor-oil plant	25, 35, 74, 80, 104, 113, 118, 128, 129
baje (*Tamil*, vasambu)	*Acorus calamus*	sweet flag	77, 87, 100, 102, 104, 114
banni	*Acacia ferruginea*	wattle tree	125, 156
ba:ti giḍu	*Elettaria cardamomum*	Malabar cardamom	31, 90
bava:ci	?	(a creeper)	112
bayeÑgi	*Salix tetrasperma*	Indian willow	35, 156-158, 161
be: haṇṇu	*Ensete superbum*	wild plantain	25, 33, 87, 128,
beḷḷa beÑguve	*Allium sativum*	garilc	24, 81-83, 128 144, 147
beṇḍe	*Kydia calycina*	peach-tinted panicled mallow	23

[p.223]

4: Hockings E-5 (1962-1977) 1980
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benguve	*Allium cepa*	onion	24, 72, 111, 128, 138-140, 144, 147
be:r kẹḍale	*Arachis hypogaea*	groundnut, peanut	74, 80, 109
be:vu	*Azadirachta indica*	nim tree	82,121, 144
bikke	*Elaeocarpus oblongus*	olive linden	25,128
bilva	*Aegle marmelos*	Indian quince	139
bi:r ganje	*Hordeum hexastichum*	brewer's barley	25
brinjal	*Solanum melongena*	egg-plant	24
cakkaṇṇu	*Artocarpus integrifolia*	jack	25
candana	*Santalum album*	sandal	160
doḍḍa hulla maṇjige	*Oxalis variabilis*	wood-sorrel	138
doḍḍa ma:su	*Capsicum* spp.	capsicum	24
domba	*Solanum lycopersicum*	tomato	25
e‖ambe	*Plectranthus coleoides*	cockspur flower	90, 139, 156, 172
e‖anavare	*Vicia faba major*	double bean	24
eṇṇe	*Sesamum indicum*	gingelly oil (*see also* under maddu bittu)	25, 79, 104-105, 109, 113, 127
erasiṅge	*Dioscorea* spp.	wild yam	108
e:r sa:me	*Panicum sumatrense*	little millet	25
ga: giḍu	*Lonicera ligustrina*	false privet	88
ga:ke	*Solanum nigrum*	common nightshade	24
ganje	*Hordeum hexastichum*	barley	25
garike	*Cynodon dactylon*	Bermuda grass	81, 106, 138-139, 144, 147 156
gasagas	*Papaver somniferum*	opium poppy	16, 26, 34-35, 80-81, 128, 131, 140, 210
ga:su	*Solanum tuberosum*	potato	24,33
go:re	*Arundinella villosa*	(an erect grass)	112
go:re	*Carex nubigena*	spiky carex	112
go:re	*Eleocharis congesta*	(a sedge)	112
go:re	*Fimbristylis* spp.	(s sedge)	112
go:re	*Kyllingia melanospermа*	(a sedge)	112
go:re	*Microstegium phaeothrix*	(a sedge-like herb)	112
go:re	*Scirpus articulatus*	giant rush	112
gosu	*Brassica oleracea*	cabbage	24, 27
gotte	*Zizyphus trinervia*	jagged jujube	31
gujji avare	*Phaseolus vulgaris*	kidney bean	24

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hu:ṇḍi batta	*Panicum sumatrense*	little millet	25, 83, 90, 103, 109
hasini	*Sarcococca trinervia*	berried box	117
hittili avare	*Dolichos lablab* var.	small bean	24, 210
hoga soppu	*Nicotiana tabacum*	tobacco	26, 34, 36, 104, 111, 128-129, 212
homogu	*Spilanthes acmella*	pellitory	88
hone	*Hypericum*, 5 app.	St. John's wort	161
hone mora	*Pterocarpus marsupium*	Indian kino tree	155-156
hu: giḍu	*Geranium nepalense*	geranium	113
hu: gosu	*Brassica oleracea botrytis cauliflora*	cauliflower	24
hui	*Tamarindus indica*	tamarind	83, 125
hulla majjige	*Oxalis latifolia*	wood-sorrel	103, 125, 138-139, 156
hulla majjige	*O. pes-caprae*	Bermuda buttercup	103, 125, 138-139, 156
hulla majjige	*O. tetraphylla*	wood-sorrel	103, 125, 138-139, 156
hu:mbari	*Lobelia excelsa*	giant lobelia	179
ili miccike	*Citrus medica*	lime	25, 28, 73, 79, 81, 90, 112, 131
imbi	*Citrus medica limetta*	citron, sweet lime	23, 138
iñgu	*Zingiber officinale*	common ginger	77, 121-122
ja:di kae	*Myristica fragrans*	nutmeg	122-123
jakkalu	*Berberis tinctoria*	common Nilgiri barberry	25, 99, 210-211
ji:raṅge	*Cuminum cyminum*	cumin	77, 138-139, 156
jo:lu	*Zea mays*	maize	25
ka:ḍu domba	*Passiflora* spp.	purple granadilla	25
kaḍugu giḍu	*Brassica juncea*	Indian mustard	24
kal hamiske	*Parmelia abyssinica*	(a lichen)	109
kaḷḷe	*Pisum sativum*	garden pea	24
kaṇgeḍici	*Eupatorium glandulosum*	hemp agrimony	113
ka:pi	*Coffea arabica*	coffee	10, 13, 26, 28, 34, 77, 80, 82
kappura	*Eucalyptus globulus*	blue-gum	125, 156
ka:rki	*Carissa carandas*	Bengal current	212
karottu	*Daucus carota*	carrot	33
ka: sa:me	*Panicum sumatrense*	little millet	25

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kata:ḷe	*Agave americana*	American aloe	33, 103, 137, 206
ka:vilu	*Curissa spinarum*	Bengal current	99
ka:vilu	*Gaultheria fragrantissima*	Indian wintergreen	99
ḳi:re	*Amarantus caudatus*	prince's feather	24-25, 27, 33, 113
ḳi:re	*A. hypochontriacus*	love-lies-bleeding	24-25, 27, 33, 113
ḳliyu: giḍu	*Impatiens leschenaultii*	common shrubby balsam	113
ḳoḍaṇgu	*Plectranthus macrael*	velvety patchouli	59, 120, 136, 152
ḳcḍaṇgu	*Pinilgherricus*	cockspur flower	59, 120, 136, 152
ḳcḍaṇgu	*Pogostemon* spp.	patchouli	59, 120, 136, 152
ḳorali	*Setaria italica*	Italian millet	25
ḳotta malli	*Coriandrum sativum*	Coriander	31, 119
ḳudure ko:ku	*Centella asiatica*	Indian thick-leaved pennywort	113, 153
ḳudure ko:ku	*Hydrocotyle conferta*	marsh pennywort	113, 153
kudure ko:ku	*Viola serpens*	common wood violet	113, 153
kumba:ke	*Cucurbita ovifera*	marrow	24, 72, 111
kumbua	*Cucurbita pepo*	pumpkin	24
kunna ma:su	*Capsicum annum*	chili	24, 28, 71-72, 112, 117-118, 139, 140, 152, 162, 211
kurkutti	*Rhamnus alternifolius*	Indian buckthorn	34
lavaṅgu	*Eugenia caryophyllata*	clove	77
maddñi bittu	*Sesamum indicum*	sesame (*see also eggo*)	35
ma:navare	*Dolichos lablab* var.	small white bean	24
maskae	*on Quercus infectoria*	oak galls	121-122
mette	*Trigonella foenum-graecum*	fenugreek	16, 24, 103
mojje	*Capsella bursa-pastoris*	shepherd's purse	24
mojje	*Cerastium glomeratum*	common chickweed	24
mojje	*Picris hieracioides*	hawkweed oxtongue	24
mojje	*Ranunculus reniformis*	great spearwort	24
moḷḷe muttu giḍu	*Doryopteris ludens*	(a herb)	90
moṅgilu	*Bambusa* spp.	bamboo	24, 125
moranda	*Dodonaea viscosa*	Jamaican switch sorrel	109, 123, 125-126, 156

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mu|ki:re	*Amarantus* spp.	amaranth	24,27, 33
mu||eŋgi	*Raphanus sativus*	radish	24
na:ḍu geḍki	*Eupatorium glandulosum*	hemp agrimony	113
nelahi:suu/nelahi:ppe	*Justicia simplex*	justicewort	109
nella ki:re	*Amarantus* spp.	amaranth	24, 27, 33, 129
nellu	*Oryza sativa*	rice	25, 61, 90, 103, 140, 206
ne:ri	*Syzygium arnottianum*	mountain black plum	25, 31
od haṇṇu	*Passiflora edulis*	edible passion fruit	25
olema:su	*Piper nigrum*	black pepper	16, 26, 77, 79, 83, 113
oteile	*Acacia catechu*	cutch tree	109
perc haṇṇu	*Pyrus communis*	pear	25
picci	*Prunus persica*	peach	25
pilams haṇṇu	*Prunus domestica*	plum	25
poṭṭe haṇṇu	*Physalis peruviana*	cape gooseberry	25
ra:gi	*Eleusine coracana*	finger millet	25, 29, 102, 137 206
rudraksa	*Elaeocarpus tuberculatus*	mock olive	126
rudraksa	*E. ganitrans*	utrasum bead tree	126
sa:me	*Panicum sumatrense*	little millet	25, 83, 88, 90, 102-103, 109 152
silku	*Morus alba*	white mulberry	24
so:lekuḍi	*Piper schmidtii*	common pepper of Ootacamund	34
su:lambuḷi (*Tamil*)	*Garcinia mangostana*	common mangosteen	130
sutti	*Zingiber officinale*	(dried) ginger	122
tagare giḍu	*Vicia sativa*	common vetch	117
tariki	*Mahonia leschenaultii*	holly-leaf barberry	212
tarnapsu	*Brassica campestris*	turnip	24
tauṭe	*Rhodomyrtus tomentosa*	hill gooseberry	25-26, 119, 128
ta:ve	*Pteris aquilinum*	common bracken	101, 206
teńke	*Cocos nucifera*	coconut	25, 74, 85, 112, 134
ti:	*Camellia thea*	tea	10, 13, 26, 80
toreko:lu	*Pouzolzia bennettiana*	pellitory	35, 62, 101, 118, 123

137 to:ṭṭa giḍu	*Impatiens rufescens*	pink marsh balsam	113
to:ṭṭa giḍu	*I. tomentosa*	red liberty cap	113
tulasi	*Ocimum sanctum*	sacred basil	126
tumbe	*Leucas rosemarini-folia*	dead-nettle	106, 112, 120, 131, 144, 147
ummata	*Datura* spp.	datura, thorn-apple	37, 110, 123
?	*Acacia arabica*	babul	31

Note: All of the above botanical identifications should be regarded as somewhat tentative.

S: Hockings E-5 (1962-1963) 1989
AN50 Badaga AN50

CHAPTER I

THE GEOGRAPHICAL, HISTORICAL AND ETHNIC SETTING

The Terrain

131 The Nilgiri Hills, once also known as the Blue Mountains, are a plateau some 600 square miles in area, situated in Southern India at the juncture of the three linguistic and cultural areas of Karnatak, Malabar and Tamilnād; or of 631 modern Mysore, Kerala and Madras States. Today the Nilgiris form one small 101 administrative District of Madras State. They are the homeland of the Badaga, Toda, Kota and Kurumba communities; nowadays many other peoples also live there.

133 The plateau is generally in the altitude range of 6000-8000 feet, and one peak (among the highest in peninsular India) reaches 8640 feet. In contrast with this the western quarter of the District averages around 3000 feet in altitude, and 128 forms a part of the Wynaad Plateau. In this study I use the term Nilgiris in its geographical sense rather than its political one, thereby excluding the Wynaad when I speak of the Nilgiris.

133 The slopes of the Nilgiri Plateau fall away very steeply, and on the eastern edge actually drop some 6000 feet in a distance of less than two miles. The slopes • 137 136 have always been covered by a dense subtropical jungle which harbors tigers, leopards, wild buffaloes, elephants, snakes, malarial mosquitoes, and (formerly 115 dangerous) hunting tribes still feared for their sorcery. Until the advent of the

134 not to the degree that it has in more humid areas to the west. Red soils grade to brown and then black soils, which are commonly called black cotton soils. Black soils, often varying from three to five feet in thickness and covering low-lying terrain, offer every evidence of ineffectual laterization. They are comparatively rich in silica and deficient in aluminum-iron content throughout their profiles, are base-saturated (mainly calcium), and usually have a granular to crumb structure. At lower levels in the profiles calcium concretions, called kankar in India, will often accumulate. The typical clays of the black cotton soils are montmorillonitic, so soil cracks tend to form in the dry season. Although these soils have a low humus content and are calcareous near the surface, they are in other ways similar to Russian chernozems. They might, therefore, be called tropical chernozems (Basu and Sirur 1939: 640-645, 690-696; Mohr and Van Baren 1954: 179-180, 422-426; Mukerji and Agarwal 1943: 587-588, 596-597; Raychaudhuri, Sulaiman, and Bhuiyan 1943: 264-272; Viswanath and Ukil 1944: 344, 361-362).

4. Vegetation

• 137 Moist deciduous forests, found only in remnant patches on Malabar plains, cover western Nilgiri and Wynaad slopes up to an elevation of approximately 2,500 feet (Figure 5).[5] Broadleaved trees growing to heights of over 100 feet may form a continuous canopy. Because most trees estivate in the dry season, the forests then assume a parched brown appearance. Axlewood (Anogeissus latifolia Wall.), matti (Terminalia tomentosa Bedd.), poomaraday (Terminalia paniculata Roth.),

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AM50 Badaga AM50
Kota AM55
Kurumba AM56
Toda AM60
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Kasuva

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Figure 5.

•137 teak (Tectona grandis L.), and venteak (Lagerstroemia lanceolata Wall.) are dominant and valuable timber trees. As these species are to varying degrees resistant to fire, their preponderance is partly due to the common practice of periodically firing the forest floors. Large gregarious poomaraday stands cover tracts where biotic disturbances have been intense.

Western tropical moist evergreen forests, also called ghat rain forests, are best developed in sections where over 100 inches of annual rain fall on western slopes between 1,500 and 4,000 feet. Trees compete for space, and the upward struggle for light causes tree crowns to stand at different heights from the ground. When the overhead canopy is a tangled mass of tightly fitting crowns, very little light reaches the forest floor, and dark cool spaces then exist near the surface. A few trees growing higher than 130 feet emerge above the canopy. Frequently occurring and characteristic trees are Bischoffia javanica Bl., Canarium strictum Roxb., Cullenia excelsa Wt., Dipterocarpus indicus, Elaeocarpus tuberculatus Roxb. (conspicuously buttressed), Mesua ferrea L., Palaquium ellipticum Engl., Poecilonеuron indicum Bedd., Syzygium spp., and Vateria indica L. On lower slopes, Hopea parviflora Bedd. is sometimes common. Areaga wightii Griff., Caryota urens L., Pinanga dicksonii Griff. are upright scattered palms, but several species of climbing palms (Calamus spp.) are also present. Among the giant creepers climbing to the highest tree crowns are the snuffbox sea bean, Lens phaseoloides Stock., and a gymnosperm, Gnetum scandens Roxb. Short. Reed bamboos--Ochlandra spp., Oxytenanthera sp., and Teinostachyum sp.--grow close to the

6: Noble K-4,5 (1962-1963) 1989
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AN50 Badaga AN50
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•137 ground. Higher up, a large number of aroids, ferns, and mosses lead an epiphytic existence on tree trunks or branches.

Moist deciduous forest on the Wynaad are in leeward areas which receive 50 to 90 inches of rain per year. Scattered remnants of similar forests occur on eastern Nilgiri slopes with over 50 inches of annual rain. These forests contain trees growing higher than 100 feet and forming a continuous canopy. Matti and teak tend to be the dominant species. However, in higher rainfall areas, matti and myrabolan (Terminalia chebula Retz.) trees outnumber teak. Axlewood and venteak are also common.

Dry deciduous forests on the Wynaad occur in interior sections where annual rainfall is between 30 and 50 inches. Eastern Nilgiri slopes with less than 30 inches annual rainfall are associated with remnants of dry deciduous forests. Trees do not grow as high as those in moister areas and generally form a broken canopy. Axlewood is the dominant species, but teak is also abundant. Scattered matti, myrabolan, rosewood (Dalbergia latifolia Roxb.), vengai (Pterocarpus marsupium Roxb.), Albizzia chinensis Merr., Caruga pinnata Roxb., and Vitex altissima L. trees grow alongside the two main species.

On dry northern Nilgiri slopes and in the Mysore Ditch, where annual rainfall is probably less than 30 inches, there are more open deciduous savanna woodlands with some pure red sanders (Pterocarpus santalinus L.) tree stands. Rocky terrain may be partially responsible for the concentrations of this species. Besides the red sanders trees, there are scattered acha (Hardwickia binata Roxb.), axlewood, sandalwood (Santalum album L.), and teak trees. Occasional

137 occurrence of Acacia leucophloea Willd. and A. chundra D. C. reflect the semiarid conditions.

Xerophytic close thorny thickets occur in portions of the Mysore Ditch sloping to the Central Plain and on lower eastern slopes. Where biotic influences have been intense on lower southeastern Nilgiri slopes and on portions of the Central Plain, there are now discontinuous thorny thickets. The thorny thickets occur where annual precipitation is less than 35 inches. Acacia chundra Willd., A. leucophloea Willd., and A. planifrons W. & A. are the dominants among trees which may form a single low canopy from 20 to 30 feet above ground. Albizzia amara Boiv., Chloroxylon swietenia DC., Euphorbia spp., Manilkara spp., and stunted trees of the same species found in deciduous forests grow among the acacias.

Subtropical moist evergreen forests, which rise above western tropical moist evergreen forests and are also transitional to temperate forests (sholas) in other parts of the Nilgiris, extend up to approximately 6,000 feet. Although plants from lower and higher elevations grow in subtropical moist evergreen forests, the substantial number of evergreen species confined almost entirely to these forests makes them distinct. Most trees are below 60 feet in height and generally form a closed canopy. Mixing of many tree species is characteristic, but Elaeocarpus spp., Hydnocarpus alpina Wt., Syzygium jambolanum DC., and Schefflera spp. may be dominants. Other trees frequently occurring are Celtis wightii Pl., Litsaea stocksii Hk., Meliosma arnottiana Wt., Michelia champaca L., and Symplocos spicata Roxb.

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Savanna grasslands resulting from biotic disturbance in forested areas occur alongside all the tropical and subtropical associations hitherto mentioned. On the savannas there are a few to a large number of scattered tree species found also in nearby forests. According to the intensity of biotic disturbance, grasses present will vary in height from less than 6 inches to 8 feet. In areas that are the least disturbed biotically, Chrysopogon fulvus Chiov. and Sehima nervosum Stapf dominate on sloped terrain, but on flatter terrain Dichanthium spp. are dominants. As biotic disturbances increase, Cymbopogon spp., Heteropogon spp., Pseudanthistiria spp., and Themeda spp. will eventually dominate. Where biotic disturbances are intense and eroded surfaces appear, annual Aristida spp., Digitaria spp., Eragrostis spp., and Panicum spp. will become dominants. Ischlemum spp. are associated with moist soils. Imperata cylindrica Beauv. and Saccharum spp. grow gregariously on surfaces subject to waterlogging. However, during the monsoons Imperata and Saccharum spp. may form extensive colonies on burned lands. Typical grasses covering temperate grasslands, described later, also grow on higher subtropical savannas.

Some savanna tracts, labelled shrub savannas, have been intensively colonized by shrubby bracken (Pteris aquilina L.), lantana (Lantana aculeata L.), and a small palm (Phoenix humilis Royle). On eastern Nilgiri slopes and on mountains west of Coimbatore there are large tracts covered by shrub savanna (Figure 5). Cleared tracts in dry and moist deciduous forests are frequently invaded by bamboos. Bambusa arundinacea Willd., growing 100 feet tall, colonizes more humid areas. The shorter Dendrocalamus strictus Nees colonizes drier

•137 sections. Where shorter grasses grow between large clumps of these bamboo species, bamboo savannas may be said to exist. An unusually large area covered by bamboo thickets extends from the Nilgiri massif, across the Mysore Ditch, and into Mysore State. The general distribution of the bamboo thickets broadly delineates a migration corridor from Mysore State to the Nilgiri massif and the Wynaad Plateau. Biotic disturbances associated with men have doubtlessly occurred in the area for a long time, but concentration of bamboo thickets may also depend upon some hitherto undefined natural causes.

Above 6,000 feet, scattered temperate forests called sholas are separated by grasslands and agricultural clearings. Numerous tree species in these forests are distinctly temperate in type, and most shola trees are less than 40 feet in height. The continuous canopy forests are cool, dark, and open near the surface. Glochidion neilgherense Wt., Meliosma wightii Planch., Michelia nilagirica Zenck., and Syzygium spp. sometimes dominate. Daphniphyllum glaucescens Bl., Gordonia obtusa Wall., Rapanea wightiana Wall., Symplocos foliosa Wt., and Ternstroemia japonica Th. are common shola trees.

Temperate grasslands above 6,000 feet are associated with grasses kept short through annual fires and frequent grazing by livestock. In areas the least disturbed biotically, Cymbopogon polyneuros Stapf., Heteropogon contortus Beauv., Ischaemum indicum Merr., and Themeda spp. will flourish. The appearance of Andropogon spp., Bothriochloa spp., and Eragrostis spp. indicates increased biotic disturbance. Presence of Cynodon dactylon Pers., Digitaria spp., and Eragrostis poaeiodes Beauv. is associated with intense biotic

137 disturbance and soil erosion. Andropogon polypticus Steud. is the dominant grass in some boggy depressions and frost pockets. Besides grasses, a host of other plants ranging in size from minute herbs to short trees grow on the grasslands. Blooming Strobilanthes spp. periodically color entire slopes with their flowers. Bracken (Pteris aquilina L.) sometimes grows in colonies over burned areas on lower slopes. Imported broom (Cytisus scoparius Link.), gorse (Ulex europaeus L.), and eupatorium (Eupatorium glandulosum H. B. & K.) have become weeds, occasionally forming large colonies. Indigenous Berberis tinctoria Lesch., Dodonaea viscosa L., Gaultheria fragrantissima Wall., Hypericum mysorense Heyne, Mahonia leschenaultii Tak., Oldenlandia stylosa O. Kze., Rhodomyrtus tomentosa Wt., and Sophora glauca Lesch. shrubs grow singly on the grasslands, or form colonies. Rhododendron nilagiricum Zenck. trees--highly resistant to fire--are capable of growing singly far out on the grasslands, but also form loosely knit colonies. Scrub growth composed of Rhododendrons mixed with the above-mentioned shrubs represents a transitional state from grassland to shola. Many black wattle (Acacia mollissima Willd.) and blue gum (Eucalyptus globulus Labill.) trees, indigenous to Australia, have been planted on grassland tracts (for information concerning introduction of plants, see Appendix B).A

A, [See Category 137, pp. 228-231--Analyst]

6: Noble K-4,5 (1962-1963) 1989
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NOTES

000 [1]Holland (1900: 142, 151, 156, 166) considered Charnockites to be a suite of igneous intrusives ranging from acid to intermediate to ultrabasic and associated commonly with a particular hyperasthenic rock he named charnockite. Subramaniam (1959: 326, 328-329, 345) defined charnockite "as a hypersthene quartz felspar rock with or without garnet, characterized by greenish blue felspar, and greyish blue quartz, the dominant felspar being a microperthite." The same writer applied the term Charnockite Suite to only the rocks in Holland's acid division, which consist of alaskite, charnockite, enderbrite, and quartzsyenite. Holland's intermediate division is considered a hybrid produced by mixing of pyroxene granulites with Charnockitic magma, while the basic division is a modified basement rock and the ultra-basic division, a syntectonic lens. Charnockites mentioned in this work belong to the larger rock suite.

[2]Climatic data came from these sources: Francis 1915: 16; Indian Meteorological Department 1953: 345-346, 359-360, 421-422; Logan 1887, 2: ccxxxi; Nicholson 1887: 556-567.

[3]Cf. Mohr and Van Baren 1954: 356-357, "It is also reasonable to presume that many of the red loams of today will be the lateritic cuirasses [ferruginous and aluminous laterites] of a million years from now."

134 [4]Cf. Birch 1838: 94, "The laterite is the most valuable, as
135 it can occasionally be used for building, when it is superficial, as then it can be wrought with little trouble when newly exposed." Ouchterlony 1848: 3, "A bed of this rock occurs near Kaitee sufficiently indurated to be fit for quarrying for building purposes--but no use is made of it by settlers owing to it being more costly than bricks." In 1963 the writer found some vermicular laterite on a wall at Koshthiemad, in the Kundah Range.

• 137 [5]Classification of vegetational associations is based on the
121 following sources: Agrawal 1961a: 94-100; Agrawal 1961b: 309-315; Agrawal et al. 1961: 376-389; Grigg et al. 1880: 99-103; Champion 1935; Chandrasekharan 1962: 660-674, 731-747, 837-848; Fisher 1921: 8-13; Kadambi 1950: 18-30, 69-82; Shankarnarayan 1958: 90-98; Shankarnarayan 1959: 14-18.

In order to standardize species classification, these works were consulted: Blatter 1926; Bor 1954; Bor 1960; Fyson 1932, 1, 2; Gamble 1896; Hooker 1875-97, 1, 2, 3, 4, 5, 6, 7.

6: Noble K_T4,5 (1962-1963) 1989
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Ko 234 (311)

Kirgoj pastoralists. A few Kotas living at Kirgoj use nearby Mallanaud grasslands for grazing buffaloes. Although they also own cattle, only buffaloes are kept on the grasslands. Apart from miscellaneous dwellings, stalls, and pens, there is nothing distinctive about the Kota livestock centers. Using an example, the dwelling and stalls in the livestock center nearest Kirgoj are aligned into a single row with clay and stone walls covered by a sheet metal roof (Plate III, G). Nearby there is a round piled stone pen and another partially walled pen next to a bank. In June, 1963, the livestock center farthest out on the Mallanaud was used for grazing 105 buffaloes belonging to four families. When monsoon rains became too intense, buffaloes brought out in March were to be taken to the above-mentioned more protected center and kept there most of the remaining year. However, some buffaloes would be taken into the community when monsoon rains improved nearby pastures sufficiently for grazing buffaloes and cattle. Buffalo owners take turns caring for them, so there is always at least one man with the buffaloes. Women and children remain in the community. Buffalo milk and milk products are easily disposed of in Kirgoj and nearby tea plantations.

Ko (342) (343)
Ko 221 234
Ko (439)

4. Grasslands

B • 137

The evidence indicates that Nilgiri temperate grasslands and subtropical or tropical savannas with shrubs or trees have resulted from biotic disturbances active over a long period. Recent reforestation of temperate grasslands with imported Australian species tends to prove that trees once thrived on tracts now covered by grasses.

137 If imported species continue to be planted, they may some day be the dominant vegetative forms on the upper Nilgiris.

137 318 Temperate grassland formation. Annual fires set by men have certainly contributed to grassland formation on the upper Nilgiris. There is much historical evidence for the burning of old, tough, dried grasses to promote the growth of young, tender grass more edible for livestock (Appendix C). Badagas, Kotas, Todas, Cannarese, Malayalees, and Tamilians inhabiting the upper Nilgiris still burn grasses annually. Firing of grasslands is such a deeply ingrained practice that the Madras Forest Department encounters many difficulties in trying to enforce laws to protect forested or planted tracts. A record dating to A. D. 1117 contains the earliest mention of a Nilgiri ethnic group (Derrett and Duncan 1957: 47). The Todas referred to were in all likelihood pastoralists who fired grasses annually. If one thinks in terms of grasslands being burned over annually for centuries and possibly millennia, it is not difficult to envision grasslands expanding at the expense of adjacent forests. Every time flames cross grassy areas and reach shola edges they do some damage to trees. In turn, damaged trees are more easily attacked by diseases and insects. Slowly, through the years, trees along shola edges perish and grasses can then advance a little more.

133 (134) 132 Terrain on the upper Nilgiris is conducive to fire spread, for the region is characteristically eroded into rounded highland hills and mountains. Whenever forests are destroyed, sheet erosion removes soil, and relief features then tend to become more rounded. Although

6: Noble K-4,5 (1962-1963) 1989
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132 winds blow with highest velocities during easterly and westerly monsoons, those in the dry, grass-burning season blow long and steadily enough to fan flames over the undulating terrain. Surface configur-
137 ation plays a vital role in the eventual highly uneven distribution of grasslands and sholas (Plate IV; A, B, and C). In a section where disturbance is negligible, shola may stretch across large expanses between two streams (interfluvial shola). With increased disturbance, grassland spreads between stream courses. When flames reach valley edges, downward slope halts or slows their spread sufficiently to enable shola survival in valleys. Sholas will eventually be located mainly in valleys and may then form a dendritic pattern (dendritic shola). The importance of surface configuration is also revealed by the fact that small sholas (patch sholas) manage to exist in interfluvial depressions where vegetation is protected from upward moving flames. If fires through time are able to change vegetation on the landscape, one would suspect that they could ultimately produce grasslands in depressions and valleys. In the Nilgiris such is apparently the case, for occasional valley bottoms and adjacent hillsides are almost entirely in grass. Where such extreme changes have occurred, streams may become intermittent.

137 318 Not all grasslands were slow to form; some grassy tracts probably came into existence within a decade. Todas long have employed axes to fell trees, so they could obtain planks for hut construction, logs and branches to build fences, or firewood to heat food, produce (241) warmth, and cremate their dead. Badagas, Kotas, and more recent migrants to the Nilgiris cleared large tracts for crop production, and

• 137 318 (241) have utilized wood for the same purposes as Todas. Some abandoned agricultural tracts are now covered by grass, while others are covered by shrubs or tree growth. Annual firings and grazing play vital roles in grassland formation and maintenance. Examples of rapid forest removal leading to grassland formation are offered by clearings presently formed by Badagas near Toda hamlets. After trees are axed down (241) and disposed of, potatoes are cultivated. As cultivation continues, surviving scattered trees are slowly cut out. If after a few years cultivation is suspended due to soil deterioration or non-renewal of a contract with Todas, the once cultivated plots may rapidly become grass covered (Plate IV, D, E, and F). New grassland formation and maintenance result from buffaloes grazing on grasses which have sprung up over the plots, coupled in many cases with periodic burning of the grasses.

172 Megalithic Cult members once living on the upper Nilgiris may have been farmers and livestock rearers. The question of whether Megalithic monuments were erected before or after ancestral Todas came to the upper Nilgiris remains unanswered. Apart from fragments of numerous pottery buffaloes in Megalithic sites, there is little conjectural association between the monument builders and Todas - unless ancestral Todas are assumed to have been bronze-iron age warriors whose descendents abandoned warfare and turned to herding only buffaloes. Construction dates for Nilgiri Megalithic sites have not been established, but may tentatively be related to a period covering a few centuries before and after 1 A.D.[9] On lids of funerary urns buried within stone circles on mountain tops (Plate V, A), figures resembling horses,

172 humped cattle, buffaloes, sheep, dogs, and chickens were fashioned with clay. The funerary urns are sophisticated in design, and other buried pottery was often more elaborately made than the pottery presently used on the Nilgiris. Bronzeware from the stone circles varies greatly in shape and is in some instances intricately decorated. Iron objects found in Megalithic sites range from broad-bladed daggers, chopping knives, sickles, razors, long and short spear points, and arrow points, to small lamps (Breeks 1873: Plates XXXVI-XLIII). The artifactual evidence, therefore, indicates that Megalithic Cult members may have cleared forests for agriculture and to obtain wood for domestic necessities. Livestock were possibly grazed on annually burned grasslands derived from cleared lands and natural openings in the forest. In this connection it may be noted that many Megalithic sites are located on peaks within the northern grasslands and near valleys in which agriculture is presently continued.

•137 Recent reforestation of the temperate grasslands. The question as to whether or not upper Nilgiri grasslands may be reforested has been partly answered. It is certain that most of these grasslands could be rapidly covered by acacia and eucalyptus trees. Thousands of former grassland acres have already been planted with these trees, imported from Australia (Plate V, B and C). The clearest historic record of vegetational change through imported tree growth is offered (175) by Ootacamund, the largest city in the Nilgiris. Eight views drawn or painted in the 1830s clearly reveal that the area was then covered by grassland and scattered sholas (Jervis 1834: illustration opposite

175 76; Baikie 1834: frontispiece, illustrations opposite 6 and 116; Barron
137 1837: first four paintings). Grasses covered most sections sloping down
to Ootacamund Lake, and St. Stephen's Church was surrounded by grass-
land. Through funds made available by the Madras State Government,
137 approximately 8,000 acacia and eucalyptus trees had been planted around
(654) Ootacamund before July, 1857 (Cleghorn 1861: 176). After his 1860 visit
Sir Clements Markham (1862: 357) noted that "except to the N.W., the
station is completely surrounded by grass-covered hills. Houses are
scattered about under the shelter of the hills, with gardens and plan-
tations of Eucalyptus and Acacia . . ., around them [the houses] . . . ."
A photograph and a painting reveal that imported trees had become well
established next to Ootacamund Lake by 1875, but grassy patches were
still noticeable features on the landscape (Price 1908: illustration
opposite 32; Murphy 1953: illustration opposite 196). Photographs taken
in 1905 prove that Ootacamund had become a forested city (Price 1908:
illustrations opposite 33, 73, and 159). Slopes next to the diminished
lake and portions of the former lake area filled with earth were, with
the exception of the racecourse, mostly covered with either trees or
houses. On the mountain behind St. Stephen's Church many eucalyptus
trees were growing, and tall cypresses grew in the churchyard.

Although hundreds of foreign plants now grow in Ootacamund,
certain species predominate. Most common acacias are the green and
silver wattles (Acacia decurrens Willd., A. dealbata F.V.M.), but
black and golden wattles (A. mollissima Willd., A. pycnantha Benth.)
are also raised. Cypresses flourish, the Monterey cypress (Cupressus
macrocarpa Hartw.) being grown all over the city as an ornamental, a

137 firewood-producing tree, or as an easily managed hedge plant. Weeping cypress (C. funebris Endl.) grows in St. Stephen's churchyard and elsewhere. Blue gum (Eucalyptus globulus Labill.) is the most frequently planted eucalyptus species. Some blue gums, such as those growing on the eastern edge of the Botanical Gardens, are among the tallest trees in India.[10] Cinchona (Cinchona spp.) and tea (Camellia sinensis O. Ktze.) are grown on adjacent mountain slopes.

121 Future temperate grassland-shola ecology. If biotic disturbances ceased for several centuries, it is likely that sholas would slowly spread onto areas now covered by grasses. Since biotic disturbances are so abundant, sholas will probably diminish further in size. Most shola trees are economically useless when compared to fast-growing Australian species. Thus, in all likelihood the latter will be fostered to the general detriment of shola species. Because the human population on the Nilgiris is increasing, hunger for agricultural and pastoral lands tends to further shola destruction. One proof of this is offered by the Malayalee or Tamilian squatters who have been invading the Nilgiris and clearing sholas in places where they have settled. To prosecute such settlers generally requires long and costly litigation, so offenders are often left alone. The Madras Forest Department and individuals will plant acacias and eucalypti on abandoned agricultural or pastoral lands.

137 Whether or not shola species could spread into and eventually overcome acacia and eucalyptus stands is debatable. The imported plants, which thrive under semi-arid conditions in Australia, grow in

137 the upper Nilgiris because of an annual dry season and the fact that they are planted on grasslands where conditions are less humid than in shola interiors. Less humid conditions tend to be continued in acacia and eucalyptus stands. Grassland soils are not conducive to shola growth, and soils under imported tree species tend to remain insuffi-
(130) ciently improved to support a shola association. Under eucalyptus trees erosion is sometimes so intense that soil conditions for shola
121 species are actually worsened. However, certain indigenous plant species may be able to successfully compete with imported trees. Through slow plant succession conditions below and above ground level may ultimately be bettered enough for a shola association to be favored over foreign trees.

137 Many shola species are extremely exacting in their growth requirements. For instance, outstanding requirements of many temperate evergreen species are soil and above-surface humidity conditions not met with on open grasslands. To provide these conditions alone, it would appear that a long, slow, uninterrupted succession of plants would have to live and die before a shola association could become established. Plants playing an important role in this succession would be the colonizing, fire-resistant rhododendrons, shrubs, and herbs now growing on the grasslands (Plate V, B). Fires and grazing animals now generally prevent the succession from taking place.

Tropical and subtropical savannas. The vegetative cover of savannas varies from dominating grasslands to dominating forests with grasses and shrubs between trees. Bamboos found in more humid areas

6: Noble K-4,5 (1962-1963) 1989
(1800-1963)

AW50 Badaga AW50
Kota AW55
Kurumba AW56
Toda AW60
Madras Tribes AW63
Kasuva

137 are sometimes conspicuous on savanna lands. Savanna variations reflect varying degrees of biotic disturbances and the ability of some plants to survive under less humid conditions than those existing in nearby forests. When biotic disturbances are intense, as for example on Rangaswami Betta where annual fires are set and livestock are frequently grazed, grasses dominate. Teak and other deciduous species in particular, which adjust well to dry seasonal conditions, have a tendency to survive or thrive in periodically fired areas. Grasses and shrubs then grow between dominating deciduous trees.

For the Nilgiris and Wynaad there are a few accounts covering processes leading to savanna formation (Appendix C). Agricultural or pastoral needs, as on the upper Nilgiris, have been responsible for forest removal and spread of grasses. In the southeastern Wynaad, where large tracts planted to cinchona or coffee were abandoned, annual fires eventually burned off the planted species, and grasses then took hold. Thus, trees were removed to enable the establishment of plantation gardens, and grasses moved in after planted species perished (Appendix C, Fletcher). In the Wynaad, past shifting slash-burn cultivation also caused forest removal and savanna formation (Appendix C, Morgan). Annual fires combined with grazing by livestock were everywhere vital to spread and maintenance of grasses in cleared areas. The same processes led to savanna formation on outer Nilgiri slopes (Plate V, E and F) and in the Mysore Ditch. Savannas in these regions have provided fodder to livestock 1) driven up from nearby lowlands, 2) kept in Badaga, Irula, Kasuva, and Kurumba hamlets, and 3) reared on plantations which were developed after the

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English came. Abandonment of plantation coffee gardens due to coffee leaf disease (Hemileia vastatrix B. & Br.), which reached a climax in the late 1800s, and devastations made by the green bug (Coccus viridis Green), especially between 1900 and 1910, led ultimately to savanna formation. Savannas have frequently been created by Irulas and Kurumbas. Although they have been forced to stop shifting slash-burn cultivation and are now confined to lands they own, cultivated plots are still rotated. Some unused plots are fired or grazed sufficiently for savanna to result. However, both ethnic groups are also responsible for savanna formation in 1) forests affected by annual fires and grazing, on 2) plots abandoned when shifting slash-burn agriculture was still practiced, and on 3) cleared tracts where plantation crops once existed.

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241 with mixed plants are also maintained, but these gardens may be miles away from their owners' houses and on outer Nilgiri slopes. Because
423 land is divided equally among sons upon a father's death, extensive
428 land fragmentation has taken place. To prevent further fragmentation, there is now a tendency for sons to share and jointly manage land.
311 Communal pastures are close enough to permit the keeping of livestock
361 in communities. Individually owned and communal plots covered with
245 acacia, eucalyptus, and temperate fruit trees now occur near Badaga
137 communities. Due to intensive or slowly continued temperate forest
318 clearance, only a few small remnant patches of natural forest remain on the slopes near many hamlets and villages.

The outstanding features of Badaga hamlets and villages are the
361 house-rows with compacted earth courtyards edged by low walls (Figure
351 17). House rows within a single community usually parallel each other and are frequently aligned in an easterly-westerly direction, but on flatter terrain they may surround a courtyard on two sides. Because
361 the Badagas consider it sinful to throw waste water toward the sun,
364 Lord Shiva's emblem, through alignment of houses in an easterly-west-
783 erly direction housewives may throw waste water through the back door or over the front courtyard wall without throwing it toward the sun.
841 One dwelling within a community house-row is set apart as a confinement place for menstruating women or women undergoing a postnatal pollution
368 period. In addition to dwellings, house-like temples are built into
243 house-rows. Grain is threshed and agricultural produce or firewood is
313 dried on the courtyards. These also serve as playgrounds for children,
857 as sites for performance of ceremonial rites, and as dance arenas
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[TEXT CONTINUED ON PAGE 123]

1. The Badagas

361 [103] [137] Occupance patterns. The Badaga communities of Basukolli, Devala, Kolapalli, Marakarai, Mundhatti, Pandalur, and Soladi are scattered over the Nilgiri Wynaad (Figure 2). They lie in sections with deciduous forest remnants and patches covered by bamboo thickets. The tendency for Badagas to live in nucleated communities according to ancestral custom is in the Wynaad opposed by the tendency for people to scatter over the landscape according to Malabarian custom. As a result, at one community members live in a hamlet, at another some live in a hamlet while others own houses dispersed over the nearby landscape, and at a third all Badagas dwell in dispersed houses within the area covered by the community. To cite specific examples, Marakarai has a hamlet, Devala has a hamlet and dispersed houses, and all Soladi houses are dispersed. Nucleated development follows three steps: 1) a single house is or a few joined houses are first constructed next to a courtyard, 2) a new house is then positioned adjacent to the courtyard and approximately vertical to an antecedent house, and 3) another house is built on the other side of the courtyard and approximately parallel to the previously constructed house (Figure 22). Figuratively, development leads to change from a straight line to an L-shaped to a U-shaped house arrangement. Single dispersed houses are also fronted by courtyards. The growing of at least one sacred tulasi plant within a small rectangular enclosure on each courtyard is a distinctive Badaga cultural trait. Frequent sweepings with a cowdung solution over courtyards, ground surrounding houses,

241 718 951 356

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000 of construction. Families were given clothing annually. Each week Paniyas received small monetary amounts which enabled them to purchase condiments or other articles in the local market. Betel leaves, areca nuts, and other chewing ingredients were issued weekly. On festival days Paniyas were feasted and given sweetmeats (Ranga 1934: 55-59).

Master-serf relationships still persist in the Nilgiri Wynaad. 648 Not all Badagas have Paniyas working for them, but when such a relationship exists Paniya females and males perform many of the agricultural 000 tasks. The women also prepare grain with mortar, pestle, and winnower, and carry water to Badaga houses. Using split bamboos, Paniyas make any type of basket that is required. These people live in houses built somewhat like Badaga houses. However, their houses have smaller dimensions, usually one door, and walls built of woven bamboos frequently covered with daub (Figure 23). The houses are arranged haphazardly in a nucleated community or are dispersed over hills. They are normally not far from Badaga dwellings. Paniyas have their own burial centers and worship centers with shrines.

In addition to receiving food allocated by their masters, Paniyas obtain produce from garden plants grown near their dwellings. They fish with aid of bamboo mats, bamboo fishing scoops, and fish poison (crushed Randia dumetorum Lamk. fruit). Most fish are caught during the harvesting period and in the ensuing dry season. Fishing is then facilitated by the concentration of fish in small water bodies left after the evaporation of moisture from fields, ponds, and streams. 222 An occasional food source for Badagas, Paniyas, and other Nilgiri 262 Wynaad residents are the many bamboo seeds, called bamboo rice, which .137

222 262 •137 are collected when bamboos (Bambusa arundinacea Willd., Dendrocalamus strictus Nees) periodically produce seeds and die off.

000 411 000 Mullu Kurumbas living in the western Nilgiri Wynaad and nearby Malabar Wynaad frequently hunt with bows and arrows. However, in 1963 I found no proof of their use by the Badagas and Paniyas inhabiting the Nilgiri Wynaad. Again, the evidence indicates that in most of the Nilgiri region hunting nets and spears have in the past been standard hunting implements. Paniyas have gained a reputation for hunting tigers with hunting nets and spears. According to Francis (1908: 30-31), hunting nets from various households were joined into a "V" surrounding a tiger. Directed by Paniyas up in trees, other Paniyas with spears drove the tiger toward the "V's" point while simultaneously closing the opening. The surrounding nets were slowly moved in during a period of several days, and Paniyas lit nightly fires all around the enclosure. Finally, the half dead and harassed tiger was speared to death. Similar hunts are said to still be held upon occasion.

241 Gardens. In multilayer gardens around houses these species were noted: guava, jack, mandarin orange, mango, pagoda, pummelo trees, areca (Areca catechu L.), fishtail (Caryota urens L.) palms, banana fronds, papaya plants, sugarcane, shrubby amaranth (Amaranthus cruentus L., common race), brinjal, castor, chili (Capsicum annuum L.), coffee, okra (Hibiscus esculentus Bend.), tomato, edible root-yielding canna, elephant foot yam (Amorphophalus campanulatus Bl.), tapioca, taro, creeping lablab bean, bitter-gourd, pumpkin, rose, sweet-potato,

241 and yam (compare with Table II).

Flowers and leaves of fishtail palms are used for ornamental purposes. Badagas also grow bananas in single layer gardens. After 245 cutting off stems laden with green bananas, Badagas and Paniyas place them in banana pits with pots in which green wood is burned (Figure 23). The heat and smoke within pits sealed with planks and mud cause bananas to ripen rapidly in two or three days. Leaves from planted amaranth are the only parts eaten. Badagas also eat leaves plucked 222 262 from wild amaranths (Amaranthus gracilis Desf., A. spinosus L.) 137 commonly growing in gardens. Leaves and roots of planted taro are edible. However, only the leaves cut from wild taro (Colocasia antiquorum Schott) growing next to streams and in gardens are eaten. 241 Ceara rubber plants (Manihot glaziovii Muell. Arg.) descended from stock used in experimental rubber production on adjacent plantations are now weeds occasionally left growing in gardens. Brinjal and chili seeds are first sprouted in a small nursery on stilts (Figure 23). Both plants are also planted in kitchen gardens with parallel earthen ridges. At Mundhatti, in 1963, there was a ridged kitchen garden with alternated kidney beans, brinjals, chilies, and maize. Elephant foot yam or taro are occasionally grown on ridges within single layer shaded gardens (Plate XII, F). Tapioca is increasingly being cultivated as a dry field crop planted on hoed ridges, but is not a typical Badaga crop.

243 Dry field agriculture. As upland dry fields are often left fallow, only small acreages are covered with crops at any single time.

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AW50 Badaga AW50
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APPENDIX B

THE INTRODUCTION AND SPREAD OF PLANTS

•137 Australian trees. For purposes of afforestation, beautification, and profits obtained through firewood sales, acacia and eucalyptus species were first introduced into the Nilgiris, and thereby India, during the mid-1800s. Acacias were later planted in large numbers for their bark tannin, and eucalypti became a source of eucalyptus oil extracted from leaves. Acacia dealbata F.V.M. and A. melanoxylon R. Br. were possibly brought by Dun in the early 1830s. King is also said to have introduced these two species around 1833 (Price 1908: 122). By 1860 both Acacia mollissima Willd. and A. decurrens Willd. were growing on the Nilgiris (Nair 1953: 34). Near Billakombai, in 1857, the first stand of an imported Australian species, A. melanoxylon, was planted by the Madras State Government on four acres of grassland. Through continuous planting this stand was enlarged, so that by late 1859 there were some 200,000 trees consisting mainly of A. melanoxylon and another acacia species (not identified), but small numbers of Indian Cedrus deodara Loud. and Pinus longifolia Roxb. were also grown (Cleghorn 1861: 172, 174, 185). Attempts to grow the two latter species have since been completely abandoned. A. mollissima was eventually found to be the most suitable acacia for the Nilgiris and is the one most frequently planted now. In 1834 Cotton grew the first blue gums (Eucalyptus globulus Labill.) on the Nilgiris, and in 1856 General Morgan established the first stand of them. After 1857, when sale of blue gums was started at the Ootacamund Botanical Gardens, they became the common, widely distributed eucalyptus species (Hutchins 1883: 1).

175 177 Subtropical and tropical plants. It is impossible to tell when most foreign subtropical and tropical plants were introduced. Grain amaranth, papaya, and tapioca are three plants which may have spread rapidly after their introduction by Europeans coming to Malabar. As amaranths (also grown in temperate areas) are cultivated in the Himalayas, their use possibly spread northward from the Nilgiris via the Eastern Ghats (Nakao and Sauer 1952-53, 2: 141-146). The bananas, jacks, limes, and mandarin oranges grown by natives in the early 1800s may have been associated with Nilgiri agriculture for a long period (Buchanan 1870, 1: 402; Harkness 1832: 90). Baikie (1834: 36) saw citrons and loquats growing at Dimbhatti and Billical. Spread in the use of some plants initially grown at Burliar and Kalhatti experimental gardens doubtlessly occurred. When Cleghorn visited Thomas' Burliar 177 garden in 1857, he saw allspice (Pimenta officinalis L.), cinnamon (Cinnamomum zeylanicum Bl.), clove (Eugenia caryophylata Thunb.), cacao (Theobroma cacao L.), jack, lime, loquat, mangosteen (Garcinia mangostana L.), nutmeg (Myristica fragrans Houtt.), orange (probably